



April 15, 2019

Chris Nagel
Director, Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Re: Statistical Method for Evaluating Groundwater at City of Columbia Water & Light
Department Inactive Surface Impoundment (More's Lake)

Dear Mr. Nagel:

The final rule for the regulation and management of Coal Combustion Residuals (CCR) was published by the United States Environmental Protection Agency (USEPA) in 40 CFR §257 and §261 (herein referred to as the Final Rule). The Final Rule applies to the CCR surface impoundment known as the inactive surface impoundment (More's Lake; currently in process of closure by removal) that is present at City of Columbia Water & Light Department's (City) Columbia Municipal Power Plant (CMPP). 40 CFR §257.93 of the Final Rule requires a groundwater sampling and analysis program to be implemented at the inactive surface impoundment and identify statistical methods to assess groundwater data generated pursuant to the Final Rule. The City has contracted Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to develop and implement a groundwater monitoring program at the inactive surface impoundment in accordance with the requirements of the Final Rule. Groundwater monitoring activities completed to date include: development of a groundwater monitoring program capable of detecting a release from the inactive surface impoundment to groundwater, installation of a groundwater monitoring well network at the inactive surface impoundment, and collection of at least eight independent groundwater samples from each monitoring well in the monitoring network at the inactive surface impoundment. These activities have been performed in accordance with 40 CFR §257.93.

Per 40 CFR §257.105(h)(4) and 40 CFR §257.93(f)(6), the City is required to place this selection of a statistical method certification in the facility's operating record by April 17, 2019. This letter presents the method(s) that will be used to assess the available groundwater data and a narrative of the tests that will be used to perform statistical evaluations of groundwater data collected at the inactive surface impoundment.

Selection of Statistical Method

Burns & McDonnell, in consultation with the City, has initiated evaluation of the data from constituents included in 40 CFR §257 Appendix III and Appendix IV, and additional MDNR CCR water quality standard parameters, that were collected from groundwater samples in the inactive surface impoundment monitoring well network prior to April 17, 2019. Based on our initial review of the results, the statistical method described in 40 CFR §257.93(f)(3), a tolerance or prediction interval procedure, has been selected to perform assessment of whether



April 15, 2019
Mr. Chris Nagel
Page 2

groundwater results are indicative of a release to groundwater from the inactive surface impoundment. In instances where statistically significant differences are identified, additional tests will be performed to identify analyte/well pairs where statistically significant increases (SSIs) are present. Statistical analysis will be performed using Sanitas™ statistical software and in general accordance with USEPA's guidance document titled *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* dated March 2009.

Tolerance or prediction interval procedures were selected due to their ability to calculate a background limit or interval using data generated for upgradient monitoring wells. These methods also allow for the comparison of a singular data point to this calculated background limit.

The following presents a step-wise narrative of how statistical evaluation will be performed when using these statistical methods:

1. Fully validated groundwater data will be compiled into a database that is compatible with the Sanitas™ software package.
2. Upper background limits will be established using parametric and non-parametric procedures and will be based upon the results of groundwater samples collected from upgradient monitoring wells.
3. The concentrations of Appendix III and IV constituents observed in the downgradient monitoring wells will then be compared to the calculated background limit.
4. In the event the concentrations observed in downgradient wells are above the calculated background limit, it will be considered a statistical exceedance above background conditions present at the inactive surface impoundment.

While this certification presents statistical methods that have been selected to assess groundwater data generated to date in accordance with 40 CFR §257.93, the City and Burns & McDonnell reserve the right to adjust the procedures identified above or select a different statistical approach altogether. In the event statistical methods other than tolerance or prediction interval procedures are used to assess groundwater monitoring data in accordance with 40 CFR §257.93 through §257.95, a subsequent certification will be prepared pursuant to the Final Rule.

Limitations of this Certification

This letter has been prepared in accordance with generally accepted environmental engineering practices for groundwater quality assessment and reporting. Conclusions contained herein are Burns & McDonnell's interpretation of readily available data and constitute a professional opinion based on said data. No other warranty, expressed or implied, is made as to the information included in this document. In the event that others make conclusions and



April 15, 2019
Mr. Chris Nagel
Page 3

recommendations based on data contained herein, such conclusions and recommendations are the responsibility of others.

Burns & McDonnell has exercised reasonable skill, care, and diligence in preparation of this letter in accordance with customarily accepted standards of good professional practice in effect at the time this report was prepared.

If you have questions regarding the information presented herein please contact Brian Weis at 816-823-7824 or via email at bweis@burnsmcd.com.

Sincerely,

Mr. Brian C. Weis, PE
Project Manager

A handwritten signature in blue ink that reads "Chris Hoglund". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Mr. Chris Hoglund, PG
Project Geologist

cc: Christian Johanningmeier (City)
Darrell Hartley (MDNR)
Jeremiah Jackson (MDNR)